Statin Eligibility Among Young Adults Prior to Myocardial Infarction

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@AvinainderSingh #AHA17
• Incidence of MI has declined substantially in the U.S.

But not in young adults....
Background

- Challenging to predict risk in young adults

Statin Eligibility among 222 Young adults with MI

- 75% NOT Statin Eligible
- 25% Statin Eligible

Akosah et al. JACC 2003
Objective

To evaluate the performance of contemporary guidelines in identifying the need of statin therapy among a cohort of young adults who experienced their first-MI at a young age in the Young-MI registry

2013 ACC/AHA Blood Cholesterol Guideline

2016 USPSTF Statin Use Recommendation Statement

Stone et al. Circ 2013; Bibbins-Domingo et al. JAMA 2016
<table>
<thead>
<tr>
<th></th>
<th>2013 ACC/AHA Blood Cholesterol Guideline</th>
<th>2016 USPSTF Statin Use Recommendation Statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treat if LDL $\geq 190$ mg/dL</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Utilizes PCE</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>ASCVD risk treatment threshold</td>
<td>7.5%</td>
<td>10%</td>
</tr>
<tr>
<td>LDL $\geq 70$ mg/dL</td>
<td>✓</td>
<td>×</td>
</tr>
<tr>
<td>1 CV RISK FACTOR</td>
<td>×</td>
<td>✓</td>
</tr>
</tbody>
</table>
Design of Young-MI

**ENTRY CRITERIA**

- Elevated troponin or CK-MB
  OR
  ICD-9/ICD-10 Code for MI

  **AND**

  - Age ≤ 50 years at presentation

**ADJUDICATION**

- Exclusions
  - Known CAD
  - Renal dysfunction
  - Myocarditis
  - Rhabdomyolysis
  - Cardiomyopathy
  - Acute PE
  - Cardiac surgery
  - Stroke
  - Other

- **Included**
  - Type 1 MI

**DATA ASCERTAINMENT**

- Risk Factors
- Medications
- Statin Eligibility

Singh et al. Clin Cardiology 2017
Methods

- Statin eligibility determined by the 2013 ACC/AHA cholesterol guidelines & 2016 USPSTF statin recommendations
- ASCVD risk calculated according to PCE
- Statin eligible if guidelines indicate: statins recommended OR statins considered
- Patients on statins prior to MI were excluded
### Baseline Characteristics

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>N=1475</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age at time of MI, median (IQR)</td>
<td>45 (41,48)</td>
</tr>
<tr>
<td>Women</td>
<td>294 (20%)</td>
</tr>
<tr>
<td>White</td>
<td>1060 (72%)</td>
</tr>
<tr>
<td>STEMI</td>
<td>846 (57%)</td>
</tr>
<tr>
<td>ASCVD score, median (IQR)</td>
<td>4.8% (2.8, 8.0)</td>
</tr>
</tbody>
</table>
Risk Factors

- Dyslipidemia: 55%
- Smoking: 52%
- Hypertension: 44%
- Obesity: 30%
- Family History: 29%
- Diabetes: 17%
- None of Above: 9%
Statin Eligibility

**Adults ≤ 50 years with a MI**

### 2013 ACC/AHA guidelines

- LDL ≥ 190 mg/dL: N=43 (3%)
- Age > 40 years with Diabetes & LDL ≥ 70 mg/dL: N=127 (9%)
- 10-y ASCVD risk score ≥ 7.5 % & LDL ≥ 70 mg/dL: N=266 (18%)
- 10-y ASCVD risk score 5-7.5% & LDL ≥ 70 mg/dL: N=269 (18%)
- 10-y ASCVD risk score <5 %: N=770 (52%)

### 2016 USPSTF recommendations

- LDL ≥ 190 mg/dL: N=43 (3%)
- 10-y ASCVD risk score >10% AND 1 CV risk factor: N=226 (15%)
- 10-y ASCVD risk score 7.5-10% AND 1 CV risk factor: N=161 (11%)
- 10-y ASCVD risk score <7.5 % OR <1 CV risk factor: N=1045 (71%)

**STATIN RECOMMENDED**
- 2013 ACC/AHA: 31%
- 2016 USPSTF: 18%

**STATIN CONSIDERED**
- 2013 ACC/AHA: 18%
- 2016 USPSTF: 11%

**STATIN NOT RECOMMENDED**
- 2013 ACC/AHA: 51%
- 2016 USPSTF: 71%
Statin Eligibility

Total

49%

29%

2013 ACC/AHA
2016 USPSTF
Total Population
Burden of Risk Factors

Statin Ineligibility and Number of Risk Factors

<table>
<thead>
<tr>
<th>Number of Cardiovascular Risk Factors</th>
<th>2013 ACC/AHA</th>
<th>2016 USPSTF</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 (N=250)</td>
<td>88</td>
<td>98</td>
</tr>
<tr>
<td>1 (N=558)</td>
<td>55</td>
<td>76</td>
</tr>
<tr>
<td>2 (N=397)</td>
<td>42</td>
<td>69</td>
</tr>
<tr>
<td>3 (N=226)</td>
<td>23</td>
<td>43</td>
</tr>
<tr>
<td>4 (N=44)</td>
<td>11</td>
<td>9</td>
</tr>
</tbody>
</table>
Sex Differences

**WOMEN**
- **USPSTF**
  - 12% Statin Recommended
  - 23% Statin Considered
- **ACC/AHA**
  - 6% Statin Recommended
  - 13% Statin Considered

**MEN**
- **USPSTF**
  - 20% Statin Recommended
  - 12% Statin Considered
- **ACC/AHA**
  - 32% Statin Recommended
  - 20% Statin Considered

**STATIN NOT RECOMMENDED**
- **WOMEN**
  - 82%
- **MEN**
  - 68%

**STATIN RECOMMENDED**
- **WOMEN**
  - 64%
- **MEN**
  - 48%
Limitations

- Retrospective
- We evaluated patients who experienced a MI, and did not assess the prevalence of risk factors across young individuals at-risk for MI.
Conclusions

• The vast majority of young adults would NOT have met current guideline-based treatment thresholds for statin therapy prior to their MI.

• Significantly greater proportion of women were NOT eligible for statin therapy compared with men.
Implications

• A low ASCVD risk score may be falsely reassuring in some young adults, especially if they have risk factors

• There is a need to re-calibrate existing risk scores or develop novel approaches for risk prediction among young adults

• Increased emphasis on prevention of cardiovascular disease is needed for young adults
Cardiovascular Risk and Statin Eligibility of Young Adults After an Myocardial Infarction: Partners YOUNG-MI Registry

Avininder Singh, MBBS, Bradley L. Collins, BA, Ankur Gupta, MD, PhD, Amber Fatima, MBBS, Arman Qamar, MD, David Biery, BS, Julio Baez, Mary Cawley, Josh Klein, BS, Jon Hainer, BS, Jorge Plutzky, MD, Christopher P. Cannon, MD, Khurram Nasir, MD, MPH, Marcelo F. Di Carli, MD, Deepak L. Bhatt, MD, MPH, Ron Blankstein, MD

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Lifetime Risk

BURDEN OF RISK FACTORS AND LIFETIME RISK

Men

- 5.2% of patients
- 36.4% of patients
- 45.5% of patients
- 50.4% of patients
- 68.9% of patients

Women

- 8.2% of patients
- 26.9% of patients
- 38.8% of patients
- 39.1% of patients
- 50.2% of patients
Lifetime Risk

LIFETIME RISK

- High lifetime risk (≥39 %)
- Low lifetime risk (<39%)

OVERALL
- 80.3%

MEN
- 79.9%

WOMEN
- 81.6%

High lifetime risk (≥39 %) and Low lifetime risk (<39%) proportions for the overall population, men, and women are shown in the chart.
Enhancement of Statin Eligibility

ACC/AHA
ACC/AHA + LDL > 160
ACC/AHA + FAMILY HISTORY
ACC/AHA + LDL > 160 + FAMILY HISTORY

% ELIGIBLE FOR STATINS

18
21
32
35

31
31
31
31

Statin Recommended
Statin Considered

American Heart Association
life is why™

SCIENTIFIC SESSIONS 210